METRIC
MIL-PRF-85045/27A
19 January 2010
SUPERSEDING
MIL-PRF-85045/27
18 May 2001

PERFORMANCE SPECIFICATION SHEET

CABLE, FIBER OPTIC, SIX-FIBER BUNDLE, BLOWN OPTICAL FIBER, CABLE CONFIGURATION TYPE 1 (BUFFERED FIBER), APPLICATION B (SHIPBOARD), CABLE CLASS SM AND MM (METRIC)

This specification is approved for use by all Departments and Agencies of the Department of Defense.

The requirements for acquiring the product described herein shall consist of this specification sheet and MIL-PRF-85045.

CLASSIFICATION:

Fiber optic cable configuration type (cable bundle): 3

Fiber cable class: MM (graded-index, glass core and glass cladding, multimode)

SM (dispersion-unshifted, glass core and glass cladding, single mode)

DESIGN AND CONSTRUCTION:

Fiber:

Type MM fibers shall be in accordance with MIL-PRF-49291/6.

Type SM fibers shall be in accordance with MIL-PRF-49291/7.

Buffer diameter: 250±15 µm

Finished cable:

Dimensions and configuration: See figure 1. An outer jacket shall be applied over six optical fibers and a ripcord.

Optical Fiber Cable Components (OFCC) Kink: Not applicable.

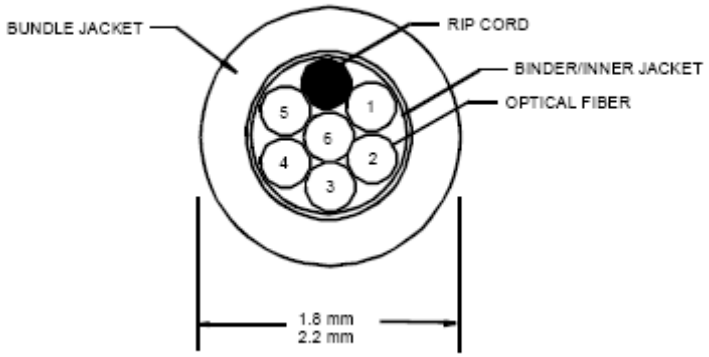

FIGURE 1. Blown optical fiber bundle.

Color:

Slate or blue (MIL-PRF-49291/6 fiber)

Yellow (MIL-PRF-49291/7 fiber)

Concentricity: ≥0.50

Jacket material: The overall jacket shall be composed of a low halogen, low toxicity polymer material.

Mass per unit length: ≤3 kg/km

Short-term minimum bend diameter: 76 millimeters. (The short-term minimum bend diameter is to be used in all environmental and mechanical tests that specify a cable minimum bend diameter.)

Long-term minimum bend diameter: 76 millimeters

Minimum continuous length: The minimum continuous length of all cables shall be not less than 0.5 kilometers. If lengths less than 0.5 kilometers are specified in the purchase order, Conformance Inspection shall be performed on test specimens not less than 0.5 kilometers in length from which the purchase order lengths are cut.

Marking: Marking of blown optical fiber bundles is not required. Shipping containers and bundle reels shall be marked.

PERFORMANCE REQUIREMENTS:

Optical properties:

Maximum attenuation rate:

3.75 dB/km at 850±20 nanometers, 1.25 dB/km at 1,300±20 nanometers for type MM fiber

0.75 dB/km at 1,310±20 nanometers and 1,550±20 nanometers for type SM fiber

Bandwidth: Shall be in accordance with MIL-PRF-49291/6.

Change in optical transmittance: Measurements to be made at 1300±20 nanometers. For shock testing only four fibers are required to be monitored.

Crosstalk: Applicable

Mechanical properties:

Tensile loading and elongation: Not applicable

Operating tensile loading: Not applicable

Dynamic bend: Not applicable

Low temperature flexibility: Not applicable

Cyclic flexing: 500 cycles at +25±2 °C and 100 cycles at –28±2 °C. Change in optical transmittance measurements are to be made every 100 cycles for the 500-cycle exposure and every 25 cycles for the 100-cycle exposure. Each change in optical transmittance measurement shall be performed with the test specimen in the same position in the test cycle. The cycling may be halted to perform the change in optical transmittance measurement. At low temperature splitting, cracking, or crazing of bundle jacket may be permitted so long as there is no splitting, cracking, or crazing of inner jacket.

Crush: Not applicable

Cable twist bending: Not applicable

Impact: Not applicable

Corner bend: Not applicable

Dripping: Applicable

Cable jacket tear strength: Applicable, except the cable jacket tear strength shall be 5 Newtons per centimeter minimum. Test shall be performed on samples in shear orientation.

Cable scraping resistance: Not applicable

Cable to cable abrasion: Not applicable

Durability of marking: Not applicable

Environmental properties:

Temperature range:

Operating: -28 to +65 °C

Non-operating: -40 to +70 °C

Storage: -40 to +70 °C

Temperature cycling: Change in optical transmittance measurements may be made periodically. At a minimum, one optical transmittance measurement shall be made over a period of one hour at the end of each temperature plateau.

Temperature humidity cycling: Change in optical transmittance measurements may be made periodically. At a minimum, one optical transmittance measurement shall be made at the end of each temperature plateau.

Storage temperature: Applicable

Fluid immersion: Not applicable

Flame extinguishing: Applicable. Tube ends shall be plugged with a non-flammable sealant to simulate end caps. Testing shall be performed in the following configuration, a MIL-PRF-85045/26 cable that contains one 6-Fiber bundle.

Smoke generation and flame propagation: Applicable. Tube ends shall be plugged with a non-flammable sealant to simulate end caps. The pass/fail criteria shall be as follows. The peak optical density and the average optical density of smoke produced shall be not greater than 1.2 and 0.25, respectively. In addition, the flame spread-time product at the 10-minute point shall be not greater than 27.5 meters-minutes when calculated in accordance with ASTM E84. Testing shall be performed in two configurations. The first configuration is MIL-PRF-85045/25 cables that contain seven 6-fiber bundles each. The second configuration is MIL-PRF-85045/26 cables that contain one 6-Fiber bundle each.

Shock: Applicable. The bundle shall be tested within a tube cable.

Acid Gas Generation: Applicable. <5.0 percent

Paint susceptibility: Not applicable

Chemical properties:

Halogen content: <0.2 percent

Part or identifying number (PIN):

M85045/27-01 (multimode).

M85045/27-02 (single mode)

Qualification by similarity:

Manufacturers who are qualified under this specification sheet for multimode fiber cable and whose single mode fiber cable passes the visual and mechanical, attenuation rate, temperature cycling, temperature humidity cycling, storage temperature, cyclic flexing, and thermal shock inspections specified herein, are qualified under this specification sheet for single mode fiber cable. This qualification by similarity is applicable if the only difference between the previously qualified cable and the cable under test is that the optical fiber has been changed from a multimode fiber to a single mode fiber. Testing may be performed on either one or two lengths of cable, each with a minimum length of 0.5 kilometers. Test order must be observed up to and including the storage temperature test. If only one cable length is used, the thermal shock test shall be performed after the storage temperature test.

CHANGES FROM PREVIOUS ISSUE: Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.

Custodians:
Army – CR
Navy – SH
Air Force – 85
NASA – NA

Preparing Activity:
Navy – SH
(Project 6015-2009-004)

Review Activities:
Army – AR, AV, MI
Navy – EC, YD
Air Force – 02, 19, 99
DLA – CC

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at http://assist.daps.dla.mil.